MAS223, Feedback on Assignment 3

Q39: Likelihood functions

- Parts (a) and (c) were well done.

- In part (a), some people wanted to write in terms of $\lambda = 1/\theta$. Since the question asks to use θ as the parameter, the parameter set Θ must be specified in terms of θ, and strictly speaking $L(\theta; \mathbf{x})$ should also be written as a function of θ - but you may do your calculations in terms of λ.

- Part (b) confused some people, who answered the question as though there was just a single sample x from a binomial distribution. In fact, the question says that the data here is a vector $\mathbf{x} = (x_1, \ldots, x_n)$ of i.i.d. samples from a binomial distribution.

Q41: Log-likelihood

- Generally well done, although not quite as well as Q39.

- Some people were confused with using Πs and $\sum$s, in various ways.

- A handful of people got the wrong answer through incorrectly asserting that $l(\theta; \mathbf{x}) = \prod_{i=1}^{n} \log\left(l(f(x_i; \theta))\right)$. Since $l(\theta; \mathbf{x}) = \log L(\theta; \mathbf{x})$ and, in this case, $L(\theta; x) = \prod_{i=1}^{n} f(x_i; \theta)$, the correct version of this formula would be $l(\theta; \mathbf{x}) = \sum_{i=1}^{n} \log\left(f(x_i; \theta)\right)$

Q42: Discrete maximum likelihood

- This question was well done by most people.

  A surprising number people got all the likelihood calculations correct, and then got the final answer wrong, as $\hat{\theta} = 3$ (correct is $\hat{\theta} = 2$), by incorrectly asserting that $2.20 \times 10^{-3} < 1.87 \times 10^{-3}$.